

REMARKS

Claims 19, 38, 41, 43, 44, 47-49, 52, 53, and 61 are currently pending. Claims 19, 38, 41, 43, and 44 have been amended to incorporate the subject matter of canceled claims 54-57. Claims 21-27, 30-32, 54-60, and 62-65 have been canceled without prejudice. It is respectfully submitted that no new matter has been added. Because the claims have been amended to incorporate the subject matter of claims 54-57, it is respectfully submitted that the amendment of the claims does not raise new issues nor require further search and/or consideration.

The Patent Office rejected claims 19, 26, 38, 41, 42, 44, 47, 49, 52, 53, 58, 59, and 61 under 35 U.S.C. 102(b) as being clearly anticipated by Hegde, U.S. Patent No. 6,136,682.

In the alternative, the Patent Office rejected claims 19, 26, 38, 41, 42, 44, 47, 49, 42, 53, 58, 59, and 61, under 35 U.S.C. 103(a) as being unpatentable over Hegde.

Applicant notes that each of the independent claims 19, 38, 41, 43, and 44 recites a diffusion barrier formed of three or more layers or sub-layers.

Hegde does not disclose or suggest this arrangement.

Although the Patent Office assert on page 3, lines 12-13, of the Final Office Action dated October 26 2007, that Hegde discloses "wherein the plurality of stacked sub-layers are three or more stacked sub-layers," the Patent Office has not pointed out where this teaching lies.

Did the Patent Office mean column 1 lines 25-32, of Hegde, which describes undesired features of the prior art such as "the titanium/titanium nitride/titanium process requires three different deposition steps?" In the detailed description of Hegde and the drawing figures related to the invention in the detailed description, there is only described a diffusion barrier layer of no more than two layers. The dual inlaid interconnect structure of Figures 9 and 10 is formed of layers 120 and 122 (column 6, lines 22-31). A dual layer barrier is formed of a first barrier material 106 and a second barrier material 108 (column 5, lines 30-57).

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Where in the abstract, title, column 2, line 59, through column 3, line 5; column 3, lines 24-44; column 4, lines 19 and 42-53; column 4, line 63, through column 5, line 13; column 5, lines 26-29 and 44-57; column 6, lines 63-64; and column 8, lines 25-28, of Hegde (cited by the Patent Office on page 2, lines 19-22, of the Final Office Action dated October 26 2007) is there a teaching of a diffusion barrier layer of three or more layers?

On page 13, line 12, through page 15, line 12, of the Final Office Action dated October 26 2007, the Patent Office addressed Applicant's point that "Hegde teaches away from any arrangement other than a two layer diffusion barrier." What it appears that the Patent Office is trying to do is blend together Hegde's disclosed prior art with Hegde's disclosed invention. The section of the patent novelty statute cited by the Patent Office is 35 U.S.C. 102 (b) which recites "A person shall be entitled to a patent unless (b) **the invention was patented or described** in a printed publication **in this** or a foreign **country** or in public use or on sale in this country, **more than one year prior to the date of application for patent in the United States.**" The prior art invention(s) of column 1, line 12, through column 2, line 26, of Hegde is not the same as the invention of Hegde disclosed from column 2, line 59, through column 6, line 54. Blending the two together is not making a case for anticipation.

Nevertheless, for the sake of advancing prosecution, Applicant has amended claims 19, 38, 41, 43, and 44 to recite the diffusion barrier layer consists of alternating layers of tantalum and another metal including one of copper, scandium, yttrium, and lanthanum. This amended subject matter comes from claims 54-57.

The subject matter of claim 54-57 was previously rejected by the Patent Office, along with the subject matter of claims 21-25, 27, 43, 48, and 62-65, under 35 U.S.C. 103(a) as being unpatentable over Hegde in view of Toyoda, U.S. Patent No. 6,001,461.

Base reference, Hegde, teaches a two-layer structure of two metal nitrides – one of tantalum nitride and the other of titanium nitride.

The Patent Office asserted on page 12, lines 9-21, of the Final Office Action dated October 26 2007 that Toyoda, in column 3, lines 24-34; column 3, line 54

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through column 4, line 21; and column 5, line 21 through column 6, line 3 teaches the subject matter of claims 54-57. However, these passages seem to teach only metal compounds such as a tantalum copper alloy and not alternating layers, one of tantalum and one of another metal.

Thus, neither Hegde nor Toyoda, alone or in combination, teach or suggest the subject matter of the currently pending claims. Accordingly, claims 19, 38, 41, 43, 44, 47-49, 52, 53, and 61 are patentable over Hegde and/or Toyoda.

The Patent Office is respectfully requested to reconsider and remove the rejections of the claims 19, 26, 38, 41, 42, 44, 47, 49, 42, 53, 58, 59, and 61 under 35 U.S.C. 102(b) or 35 U.S.C. 103(a) based on Hegde and claims 21-25, 27, 43, 48, 54-57, and 62-65 based on Hegde in view of Toyoda, and to allow all of the pending claims 19, 38, 41, 43, 44, 47-49, 52, 53, and 61 as now presented for examination. An early notification of the allowability of claims 19, 38, 41, 43, 44, 47-49, 52, 53, and 61 is earnestly solicited.

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Respectfully submitted:

Walter J. Malinowski

Walter J. Malinowski
Reg. No. 43423

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Date

Customer No.: 29683

HARRINGTON & SMITH, PC
4 Research Drive
Shelton, CT 06484-6212

Telephone: 203-925-9400, extension 19
Facsimile: 203-944-0245
Email: wmalinowski@hspatent.com

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